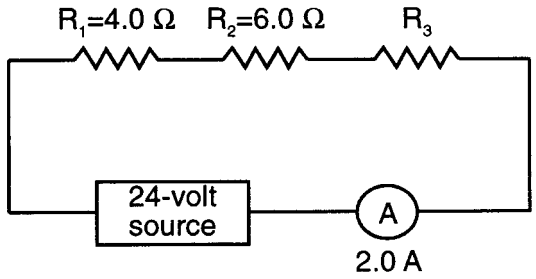
Circuits (R)

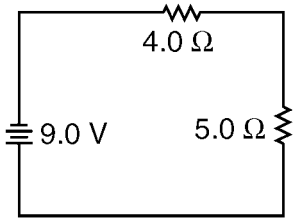
1. A student needs a 4-ohm resistor to complete a circuit. Only a large quantity of 1-ohm resistors are available. Which of the following should be done to complete the circuit?
   1) Connect four 1-ohm resistors in series.
   2) Connect four 1-ohm resistors in parallel.
   3) Connect two of the 1-ohm resistors in series and two in parallel.
   4) Connect only two 1-ohm resistors in parallel.

2. The diagram below shows a circuit with three resistors.



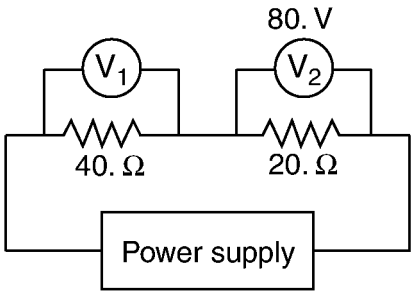
   What is the resistance of resistor R_3?
   1) 6.0 Ω
   2) 2.0 Ω
   3) 12 Ω
   4) 4.0 Ω

3. A 9.0-volt battery is connected to a 4.0-ohm resistor and a 5.0-ohm resistor as shown in the diagram below.



   What is the current in the 5.0-ohm resistor?
   1) 1.0 A
   2) 2.3 A
   3) 1.8 A
   4) 4.0 A

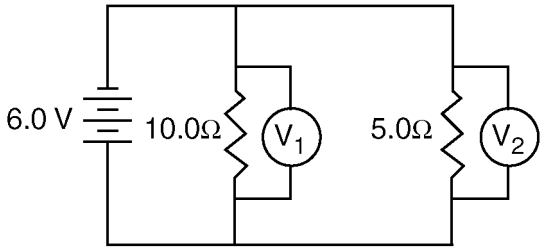
4. In the circuit shown below, voltmeter V_2 reads 80. volts.



   What is the reading of voltmeter V_1?
   1) 160 V
   2) 80. V
   3) 40. V
   4) 20. V

5. A 100.-ohm resistor and an unknown resistor are connected in series to a 10.0-volt battery. If the potential drop across the 100.-ohm resistor is 4.00 volts, the resistance of the unknown resistor is
   1) 50 Þ
   2) 100 Þ
   3) 150 Þ
   4) 200 Þ

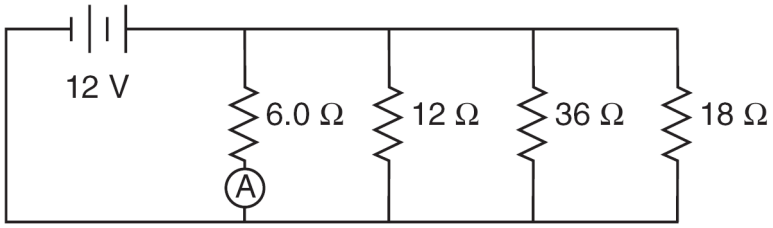
6. In the circuit diagram below, what are the correct readings of voltmeters V_1 and V_2?



   1) V_1 reads 2.0 V and V_2 reads 4.0 V
   2) V_1 reads 4.0 V and V_2 reads 2.0 V
   3) V_1 reads 3.0 V and V_2 reads 3.0 V
   4) V_1 reads 6.0 V and V_2 reads 6.0 V

Circuits (R)

Base your answers to questions **7** and **8** on the diagram below, which represents an electric circuit consisting of four resistors and a 12-volt battery.

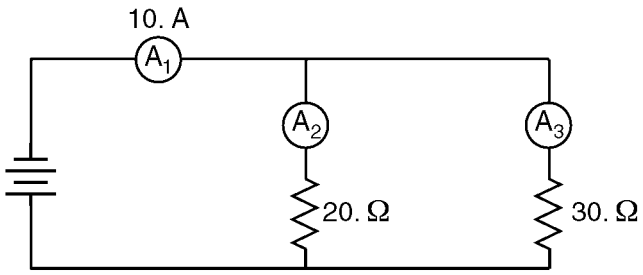


7. What is the equivalent resistance of this circuit?
   1) 72 Þ
   2) 18 Þ
   3) 3.0 Þ
   4) 0.33 Þ

8. How much power is dissipated in the 36-ohm resistor?
   1) 110 W
   2) 48 W
   3) 3.0 W
   4) 4.0 W

9. What is the total current in a circuit consisting of six operating 100-watt lamps connected in parallel to a 120-volt source?
   1) 5 A
   2) 20 A
   3) 600 A
   4) 12 000 A

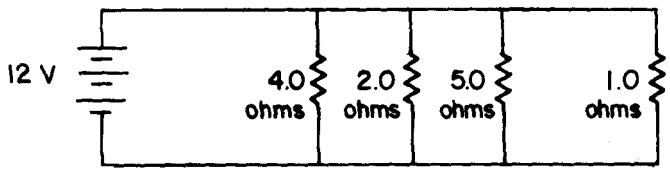
10. In the circuit diagram shown below, ammeter A_1 reads 10. amperes.



What is the reading of ammeter A_2?
   1) 6.0 A
   2) 10. A
   3) 20. A
   4) 4.0 A

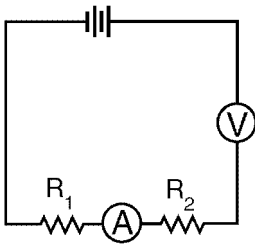
11. As the number of resistors in a parallel circuit is increased, what happens to the equivalent resistance of the circuit and total current in the circuit?
   1) Both equivalent resistance and total current decrease.
   2) Both equivalent resistance and total current increase.
   3) Equivalent resistance decreases and total current increases.
   4) Equivalent resistance increases and total current decreases.

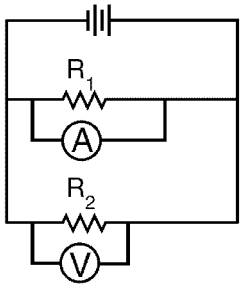
12. In the circuit diagram shown below, what is the current through the 4.0-ohm resistor?

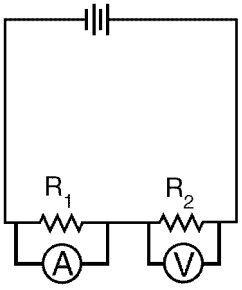


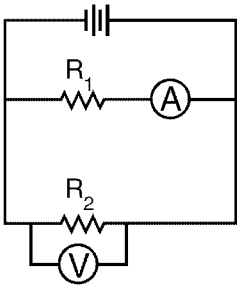
   1) 1.0 ampere
   2) 0.33 ampere
   3) 3.0 amperes
   4) 48 amperes

13. In which circuit represented below are meters properly connected to measure the current through resistor R_1 and the potential difference across R_2?

1)


3)


2)


4)


14. One watt is equivalent to one
   1) N•m
   2) N/m
   3) J•s
   4) J/s

Circuits (R)

15. A microwave oven operating at 120 volts is used to heat a hot dog. If the oven draws 12.5 amperes of current for 45 seconds, what is the power dissipated by the oven?
    1) 33 W
    2) 1.5×10^3 W
    3) 5.4×10^3 W
    4) 6.8×10^4 W

16. A device operating at a potential difference of 1.5 volts draws a current of 0.20 ampere. How much energy is used by the device in 60. seconds?
    1) 4.5 J
    2) 8.0 J
    3) 12 J
    4) 18 J

Circuits (R)
Answer Key
[New Exam]

1. 1
2. 2
3. 1
4. 1
5. 3
6. 4
7. 3
8. 4
9. 1
10. 1
11. 3
12. 3
13. 4
14. 4
15. 2
16. 4